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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,780	09/28/2001	Shahram Mihan	0050/49854	7113

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KEIL & WEINKAUF
1350 CONNECTICUT AVENUE, N.W.
WASHINGTON, DC 20036

EXAMINER

LEE, RIP A

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 10/18/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/937,780		MIHAN ET AL.	
	Examiner		Art Unit	
	Rip A. Lee		1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 10 and 13 is/are rejected.
- 7) ☒ Claim(s) 3, 8, 11 and 12 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 3 is objected to because of the following informalities: On page 3, line 3, remove the hyphen prior to the word "carbon." Furthermore, it is not clear what the Applicant intends to convey by the expression "carbon substituents." Appropriate correction is required. ✓
2. Claim 11 is objected to because of the following informalities: The claim is identical in wording to claim 8, and both claims depend from claim 3. Appropriate correction is required. ✓

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. ✓
The claim calls for the use of a 1,3,5-triazacyclohexane ligand in which one or more of the nitrogen atoms are replaced by phosphorus or arsenic atoms. Other than a brief mention in passing in the specification, but there is little else to enable one skilled in the art to prepare or use such an embodiment. In particular, there is no instruction with respect to use of arsenic containing rings for the construction of organometallic complexes.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear which pair of monomers is used in the claimed copolymerization processes. In particular, the meaning of copolymerizing "ethylene or propylene together" is not understood. Revision of the claim is required.

7. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 provides for the use of a transition metal complex, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 13 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-5, 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-231317 to Tani *et al.* in view of U.S. Patent No. 5,576,263 to Badley *et al.*

The prior art of Tani *et al.* discloses a process of olefin polymerization in the presence of a catalyst system comprising a chromium compound containing a substituted triazacyclohexane ligand and an activator (Formula I, paragraphs [0003], [0009], [0053]-[0055]). Use of chromium precursors is described in detail in paragraphs [0014]-[0016]. Borane or borate activators are listed extensively in paragraphs [0042]-[0043]. The invention encompasses polymerization of ethylene, propylene, butanes, as typical alpha olefins (paragraph [0045]). The reference does not provide an example of copolymerization of olefins as claimed. Copolymerization using chromium based catalysts is not novel as shown in U.S. Patent No. 5,576,263 to Badley *et al.*

Claim 1 of the reference is drawn to copolymerization of ethylene and a comonomer, and said comonomers include C₃-C₁₀ alpha olefins (col. 5, lines 4-7). Thus, the notion of copolymerization is well within the grasp of one skilled in the art, and it would have been obvious to arrive at use of the catalyst system Tani *et al.* for copolymerization of ethylene and alpha olefins (*i.e.*, present claims 1 and 2). One would have made the association readily because both prior art relate to chromium-based catalysts for producing polyolefins.

It would have been obvious to arrive at the compound and activator described in present claims 3-5 and 7 since these features are fully disclosed in the Tani *et al.* patent (*supra*). The use of a supported catalyst system is not disclosed in Tani *et al.* Use of a support is well-established in the field of chromium based olefin polymerization catalysts, as shown in Badley *et al.*, and the notion of using a support (as described in present claims 9 and 10) would have been obvious to one with skill in the art.

11. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koehn *et al.* (*Abstr. ACS*, 1997) in view of U.S. Patent No. 5,576,263 to Badley *et al.*

Koehn *et al.* discloses the polymerization of ethylene in the presence of a catalyst comprising of *N*-substituted 1,3,5-triazacyclohexanes (R₃TAC) and methylalumoxane (MAO) coactivator. Specifically, the organometallic compound is (R₃TAC)CrCl₃. The reference does not provide an example of copolymerization of olefins as claimed. Copolymerization using chromium based catalysts is not novel as shown in U.S. Patent No. 5,576,263 to Badley *et al.* Claim 1 of the reference is drawn to copolymerization of ethylene and a comonomer, and said comonomers include C₃-C₁₀ alpha olefins (col. 5, lines 4-7). Thus, the notion of

copolymerization is well within the grasp of one skilled in the art, and it would have been obvious to arrive at use of the catalyst system Koehn *et al.* for copolymerization of ethylene and alpha olefins (*i.e.*, present claims 1 and 2). One would have made the association readily because both prior art relate to chromium-based catalysts for producing polyolefins. Use of components described in claims 3-6 would be obvious because they are fully disclosed in Koehn *et al.*

Allowable Subject Matter

12. Claims 8 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior Art of Record

13. The prior art made of record but not relied upon is considered pertinent to the Applicant's disclosure:

WO 0058319 to Maas *et al.* relates to the same subject matter of the present invention. The patent shares the same foreign priority date.

WO 00/34211 to Jones *et al.* discloses use of a catalyst comprising a chromium compound with a 1,3,5-triazacyclohexane ligand and MAO cocatalyst for the trimerization and oligomerization of C₈-C₃₆ alpha olefins.

The following journal articles disclose group 6 metal complexes containing 1,3,5-triazacyclohexane ligands:

Köhn, R.D.; Haufe, M.; Kociok-Köhn, G.; Filippou, A.C. *Inorg. Chem.* **1997**, *36*, 6064-6069.

Köhn, R.D.; Kociok-Köhn, G.; Haufe, M. *J. Organomet. Chem.* **1995**, *501*, 303-307.

Haufe, M.; Köhn, R.D.; Weimann, R.; Seifert, G.; Zeigan, D. *J. Organomet. Chem.* **1996**, *520*, 121-129.

Köhn, R.D.; Kociok-Köhn, G.; Haufe, M. *Chem. Ber.* **1996**, *129*, 25-27.

Köhn, R.D.; Kociok-Köhn, G. *Angew. Chem. Int. Ed. Engl.* **1994**, *33*, 1877-1878.

Schumann, H. *Z. Naturforsch.* **1995**, *50b*, 1038-1044.


Armanasco, N. L.; Baker, M. V.; North, M. R.; Skelton, B. W.; White, A. H. *J. Chem. Soc., Dalton Trans.* **1997**, 1363-1368.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (703)306-0094. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (703)308-2450. The fax phone number for the organization where this application or proceeding is assigned is (703)746-7064. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

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October 12, 2002


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